10

INSTRUCTION MANUAL

FTR-2410

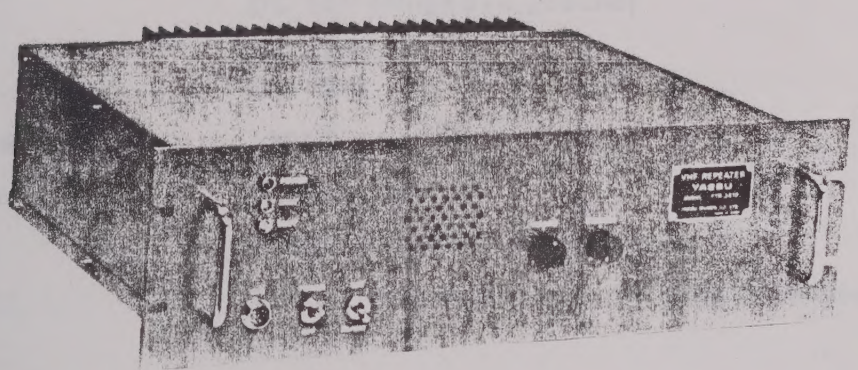
YAESU MUSEN CO , LTD.

TOKYO JAPAN.

OPERATION

MANUAL FOR

FTR-2410



YAESU MUSEN CO., LTD.
C.P.O. BOX 1500,
TOKYO, JAPAN

OPERATION

MANUAL FOR

RTR-2470

YAESU MUSEN CO., LTD.
C.P.O. BOX 1500,
TOKYO, JAPAN

The FTR-2410 is a highly reliable FM repeater, providing 10 watts of output on the VHF bands. Designed for installation in any standard 19 inch mounting rack, the FTR-2410 has a built-in time-out timer and delay timer, "musts" for any repeater system. Options such as the CTCSS decoder/encoder for tone squelch operation, tone burst decoder, phone patch unit, etc., can help you meet most special requirements. Cavity duplexers are also available, with separation of either 4.5 MHz or 600 kHz.

SPECIFICATIONS:

GENERAL

Frequency range :	148 MHz - 174 MHz Type A : 148 MHz - 160 MHz Type B : 160 MHz - 174 MHz
Type of Emission :	16F3
Number of Channels :	1 channel, crystal control
Repeater System :	Carrier operation system
Power Requirements :	AC 100/110/117/200/220/234V DC 12V (Negative ground)
Input Power :	AC 100VA DC 48W
Temperature Range :	-30°C - +60°C
Duty Cycle :	Continuous
Case Size :	133(H) x 483(W) x 356(D) mm
Weight :	12 kg. (w/o duplexer); 13.4 kg (w/duplexer)

TRANSMITTER

RF Power Output :	10 watts
Frequency Stability :	±5 ppm
Frequency Multiplication :	6 times
Modulation :	Phase modulation (FM)
Maximum Deviation :	±5 kHz
Audio Response :	+1, -3 dB/octave pre-emphasis characteristic from 300 Hz to 3000 Hz
Audio Distortion :	Better than 10% (60% deviation at 1 kHz)
FM Noise Ratio :	Better than 45 dB
Spurious Emissions :	At least 60 dB below carrier.

RECEIVER

Sensitivity :	Better than 0.5 uV for 12dB SINAD Better than 1.0 uV for 20dB QS
Frequency Stability :	±5 ppm
Adjacent Selectivity :	Better than 80dB (±25 kHz)
Intermodulation :	Better than 65dB (±25 kHz, ±50 kHz)
Spurious Response :	Better than 80dB
Squelch Sensitivity :	0.2 uV
Audio Output :	2 watts at 8 ohms (10% THD)
AF Response :	+1, -3dB/octave de-emphasis characteristic from 300 Hz to 3000 Hz

DUPLEXER (Within)

Frequency Range :	148 MHz to 174 MHz
Frequency Separation :	4.5 MHz (min.)
Insertion Loss	1.2dB
TX Noise Suppression :	80dB
RX Isolation at TX :	80dB
Maximum VSWR :	1.5 : 1
Frequency Stability :	2.5 ppm/°F

INSTALLATION AND OPERATION

1. Connect the antenna to the SO-239 connector on the rear apron. Be sure your antenna impedance is 50 ohms.

2. Insert the AC plug to the wall outlet after making sure the voltage of your local power line matches that of your FTR-2410. If the voltage is different, the power voltage and the wire connection at the power transformer of your FTR-2410 should be changed.

3. Set the REPEAT/MIC switch to MIC, and the POWER switch to ON. The POWER LED will become illuminated.

4. Preset the SQUELCH control fully counterclockwise, and adjust the VOLUME control for an adequate audio level from the speaker.

5. Set the SQUELCH control to the point where the level of background noise is reduced. After 2 seconds, the background noise will completely disappear.

TRANSCEIVER OPERATION

1. Connect a microphone to the MIC jack on the front panel and close the PTT switch of the microphone to transmit through the repeater, causing the XMIT LED to light up.

2. Release the PTT switch to return to the receive condition.

3. When a signal is present at the repeater, the BUSY LED will light up.

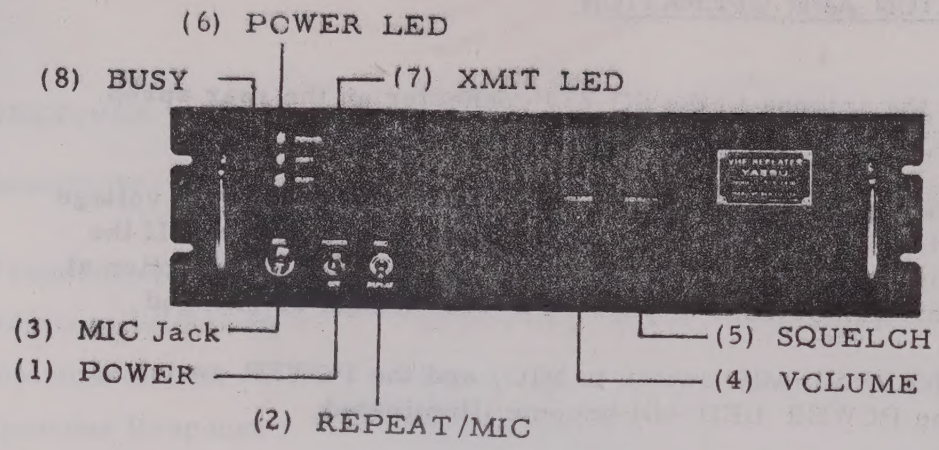
REPEATER OPERATION

1. Turn the REPEAT/MIC switch to the REPEAT position to activate the repeater function. When a signal strong enough to break the squelch is present, the transmitter turns on to send a signal.

2. When the monitoring of incoming signals is not necessary, turn the VOLUME control fully counterclockwise to reduce the audio output from the speaker.

BACK-UP BATTERY OPERATION AND CONNECTIONS

The FTR-2410 can be operated from an external battery during power shortages. To activate this function, a rechargeable battery should be connected to the BATTERY connector on the rear panel. The automatic power control circuit will automatically change to battery operation. While the power switch is on, the FTR-2410 will charge the battery continuously.



FRONT PANEL CONTROLS AND SWITCHES

(1) POWER

This is the main power switch of the FTR-2410.

(2) REPEAT/MIC

This switch changes the operating function of the FTR-2410 from repeater to transceiver, or vice versa. When this switch is in the REPEAT position, the FTR-2410 acts as a repeater, and while in the MIC position, you can speak into the microphone to use it as a transceiver.

(3) MIC Jack

This six-pin connector accepts the microphone input, and provides a standby control line.

(4) VOLUME

The volume control sets the receiver volume level.

(5) SQUELCH

The squelch control silences the receiver noise until a signal is received.

(6) POWER LED

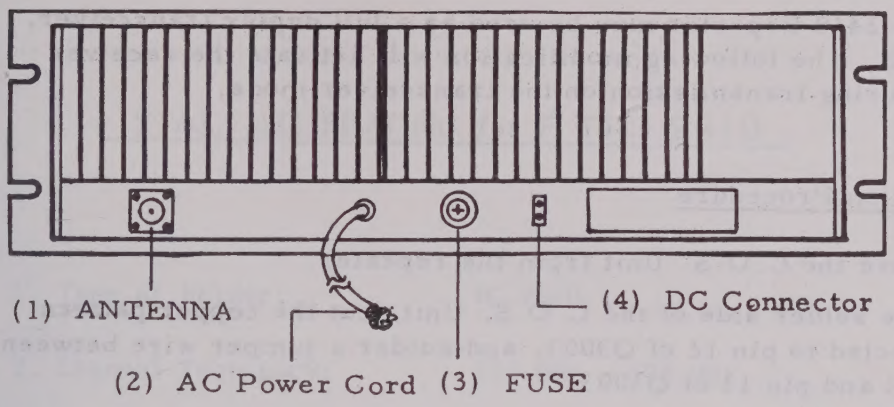
This indicator lamp will glow green during standby with AC power applied.

(7) XMIT LED

This red indicator will light up when the transmitter is activated.

(8) BUSY

This indicator will light up when a signal is received (a signal strong enough to break the receiver squelch).



REAR APRON CONNECTIONS

(1) ANTENNA CONNECTIONS

This UHF connector accommodates an antenna connection. The antenna impedance should be 50 ohms.

(2) AC Power Cord

Connect this AC power lead to the wall outlet. The power voltage of your local line should match the required voltage of your FTR-2410.

(3) FUSE

Only a properly rated fuse must be installed into this fuse holder. The proper fuse ratings per voltage are as follows:

100V - 117V	2 amps
200V - 234V	1 amp

(4) DC Connector

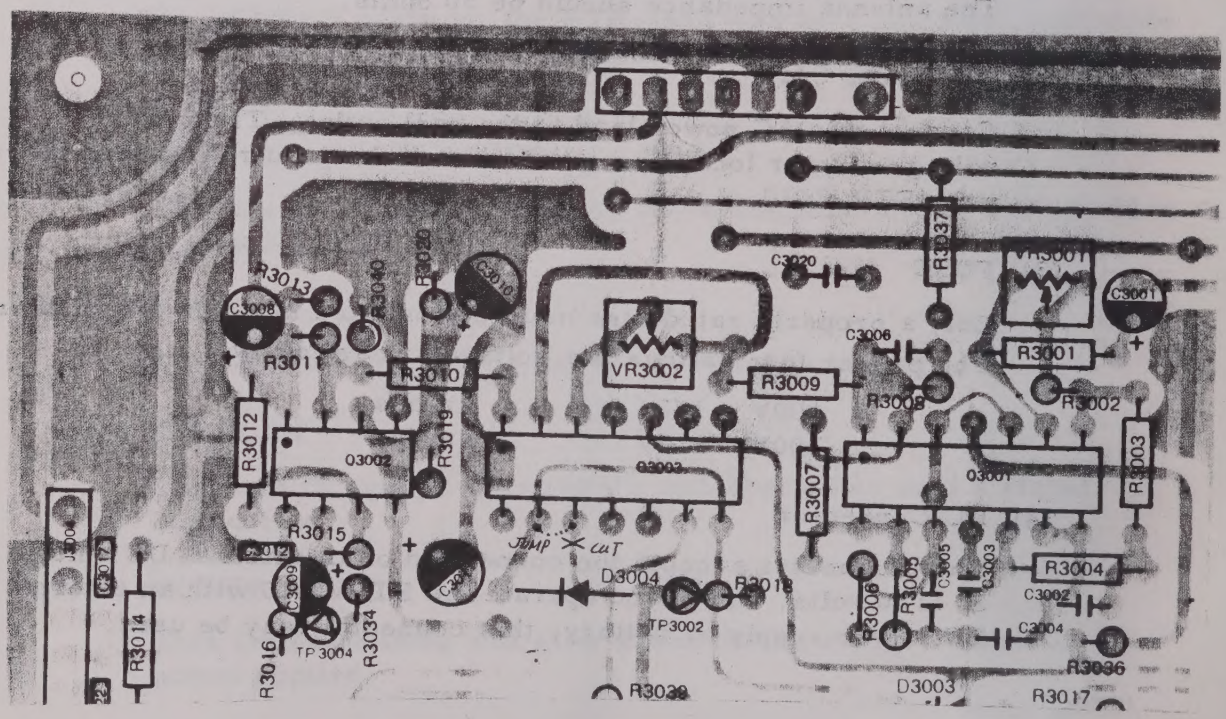
This connector accepts the connection of an external DC voltage of 12.0 volts. When you operate the FTR-2410 with an external DC power supply or battery, this connector may be used.

FULL DUPLEX MODIFICATION

The FTR-2410 Repeater may be used as a full duplex transceiver, if desired. The following modification will activate the receiver section during transmission on the transceiver mode.

Modification Procedure

1. Remove the C.O.S. Unit from the repeater.
2. On the solder side of the C.O.S. Unit, cut the copper pattern connected to pin 12 of Q3003, and solder a jumper wire between pin 12 and pin 13 of Q3003.
3. Now install the C.O.S. Unit in the correct position, as it was previously installed.



XTAL SPECIFICATIONS for FTR-2410

1. Type of Holder:	HC-25/U
2. Channel Frequency:	134 MHz - 175 MHz
3. Oscillation Frequency:	TX: CH/6 RX: (CH-21.4)/3
4. Load Capacity:	45 pF
5. Drive Level:	TS-683/TSM 2mW
6. Shunt Capacity:	TX: 134-175MHz 5.5pF±0.5 RX: 134-175MHz 4.0pF±0.5
7. Frequency Tolerance:	±10ppm at 25°C
8. Frequency Stability:	±10ppm -10°C to +50°C
9. Equivalent Resistance:	Series 17 ohm max.
10. Operation mode:	3rd Overtone

ALIGNMENT STEPS

I. RECEIVER

1-1) Second IF
1-2) Second local
1-3) First IF
1-4) First local
1-5) RF section
1-6) Sensitivity peaking
1-7) Squelch sensitivity

II. TRANSMITTER

2-1) Oscillator
2-2) Multiplier stages
2-3) Bandpass filter
2-4) Spurious reduction
2-5) Deviation setting
2-6) RF power output

III. C.O.S. UNIT

3-1) RX AF level alignment
3-2) Repeat level alignment
3-3) Timer delay and repeat noise alignment
3-4) Time-out timer alignment

IV. DUPLEXER UNIT

ALIGNMENT : RECEIVER

1-1) Second IF

Connect a 455 kHz sweep generator to the base of Q1008, and connect an XY scope (vertical amp. input) to pin 1 of J1001. Adjust T1007 for maximum p-p indication on the scope.

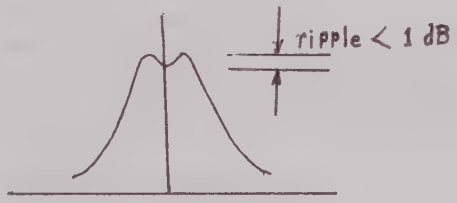
1-2) Second Local

Connect a precision frequency counter to TP1002. Adjust TC1002 for a reading of exactly 20.945 MHz on the counter.

1-3) First IF

Connect a 21.4 MHz sweep generator to gate 2 of Q1002. Gonnect an XY scope (vertical amp. input) through a diode detector, to the secondary of T1006. Now adjust T1005 and T1006 so that the pattern shown in Figure 1 is obtained, with less than 1 dB of ripple.

Fig. 1



1-4) First Local

Connect the RF probe of a VTVM to the base of Q1005 (TP1001). Adjust T1003 and T1004 for maximum indication on the VTVM.

Connect the RF probe of a VTVM to gate 2 of Q1002. Adjust L1008, L1009 for maximum indication on the VTVM.

Connect a precision frequency counter to the base of Q1005 (through an 0.01 uF capacitor). Preset the core of T1002 to be flush with the top of the shield can. Now adjust TC1001 and T1001 for the following frequency :

$$f_{test} = \frac{f\,(\text{RX channel}) - 21.4\ \text{MHz}}{3}$$

1-5) RF Section

Connect a precision VHF signal generator to the antenna jack, and connect an AF millivoltmeter to the speaker (use 8 ohm termination). Inject a singal on the channel frequency at a level providing about 10 dB of noise quieting. Now adjust L1001, L1002, L1005, L1006 and L1007 for maximum noise quieting as shown on the meter. Adjust the signal generator level, and meter scale, as needed to provide a meaningful display.

1-6) SINAD Sensitivity

Connect a signal generator set to the channel frequency, with 1 kHz mod. @ ± 3 kHz deviation to the ANT jack. Connect an audio distrotion meter to the speaker, using an 8 ohm termination. Inject a signal from the generator so that the distortion meter indicates 25% distortion. Adjust T1005 and T1006 for minimum distortion. Now reset the signal generator level for 25% distortion, and again adjust T1005 and T1006 for minimum distortion. Repeat several times.

1-7) Squelch Sensitivity

Connect a signal generator to the antenna jack, and set the SQL control fully clockwise. Apply a 1 uV signal from the generator, and adjust VR1001 so that the squelch just opens.

ALIGNMENT : TRANSMITTER

2-1) Oscillator Circuit

Connect a dummy load/VHF wattmeter to the antenna jack. Connect the RF probe of a VTVM to the base of Q2003. Close the PTT switch, and adjust T2003 for maximum deflection on the VTVM. Now connect a frequency counter to the base of Q2003 and adjust T2001/T2002 (coarse tuning) and TC2001 for exactly the following frequency :

$$f_{test} = \frac{f\,(\text{Transmit channel})}{6} \text{ MHz}$$

2-2) Multiplier Stages

Leave the dummy load/wattmeter connected to the antenna jack. Turn VR2002 fully clockwise. Now connect a DC voltmeter between TP 2002 (negative) and TP2007 (positive). Adjust T2005 and T2006 for maximum indication on the voltmeter. Now connect the meter to TP2003 (negative) and adjust T2007 and T2008 for maximum indication on the meter. Connect the wattmeter to the antenna jack, and adjust T2008 ,T2009, TC2002, TC2003 and TC2006 for maximum indication on the wattmeter.

2-3) Bandpass filter adjustment

Assemble the test equipment as shown in Figure 2. Adjust T2006 - T2009 and TC2002 - TC2006 so that the display shown in Figure 3 is obtained. Several passes through the alignment procedure may be necessary to achieve the proper bandpass.

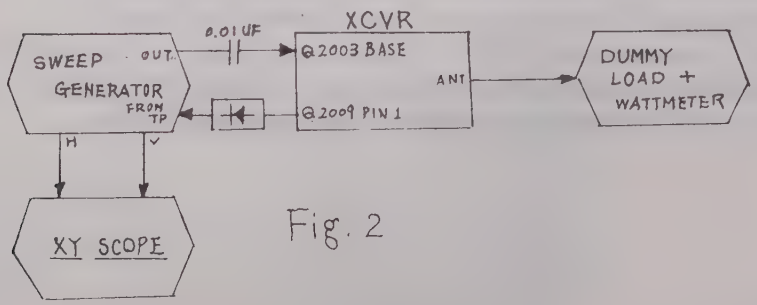


Fig. 2

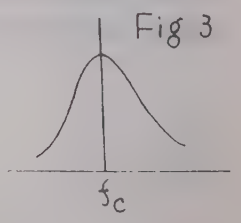


Fig 3

2-4) Spurious reduction

Connect a 6 dB hybrid combiner to the antenna jack. Connect a dummy load/wattmeter and a spectrum analyzer to the hybrid. Adjust TC2003 for minimum spurious emission over the range 1/2 f_t to 3/2 f_t (f_t = TX frequency). Now adjust TC2006 for minimum spurious signals over the range 5/6 f_t to 7/6 f_t.

Recheck the bandpass filter tuning after adjustment of TC2006.

2-5) Deviation setting

Assemble the test equipment as shown in Figure 4. Inject a 1 kHz signal at -43 dBm at the mic jack. Adjust VR2001 for a deviation of ±4.9 kHz. Now reduce the AF generator level, so that the deviation reaches ±3 kHz. Adjust T2003 and T2004 for minimum distortion. If the deviation changes during this alignment, adjust it again. Several passes may be necessary.

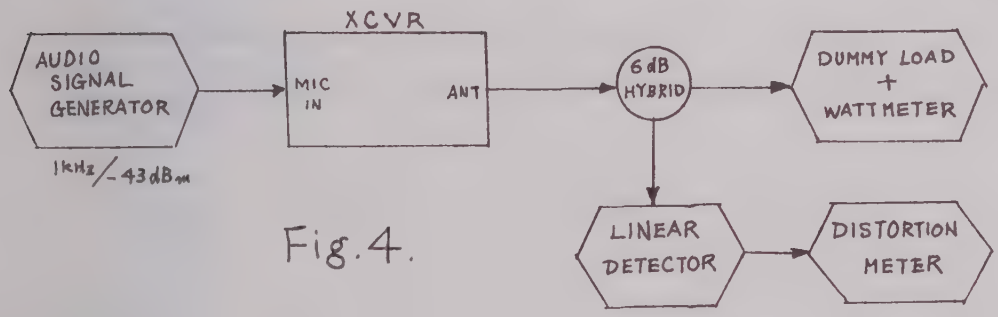


Fig.4.

2-6) RF power adjustment

With the dummy load/wattmeter connected to the antenna jack, adjust VR2002 for 10 watts RF output.

ALIGNMENT :Ⅲ.C.O.S. UNIT

3-1) RX AF Level Alignment

Apply a 1 mV signal with 1 kHz mod., ±3 kHz deviation to the ANT jack, and connect an AF voltmeter to pin 7 of Q3001. Adjust VR3001 so that +4 dBm is obtained on the voltmeter.

3-2) Repeat Level Alignment

While applying a 1 mV signal with 1 kHz mod., ±3 kHz deviation, connect an AF voltmeter to TP3003. Adjust VR3003 for a deflection of -55 dBm (600 ohms) on the voltmeter.

3-3) Timer Delay and Repeat Noise Level Alignments

Apply a 1 mV signal from the signal generator to the ANT jack, and connect an oscilloscope to TP3002. Set the Squelch control to the center position, and adjust VR3004 so that the DC level on the scope decreases three seconds after the RF signal is turned off.

Connect an AF voltmeter to TP3004 and adjust VR3002 to the point where the noise level is reduced 20 dB, while the timer is activated.

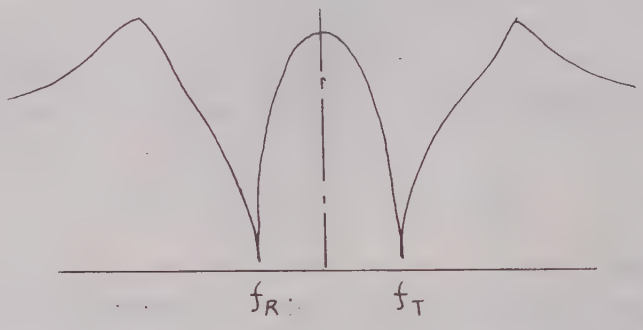
3-4) Time-out Timer Alignment

Connect an oscilloscope to TP3001 and apply a signal from a signal generator. This will produce a pulse wave on the scope. Adjust VR3005 so that a pulse width of 21.4 uS is obtained on the scope (for three minutes).

ALIGNMENT :Ⅳ.DUPLEXER

Connect a dummy load to the ANT jack of the duplexer, the output of a spectrum analyzer/tracking generator to the TRANS jack and the input to the REC jack.

Adjust the tuning screws of the duplexer until maximum attenuations are obtained on both receive and transmit frequencies on the analyzer, as shown below.



MAIN CHASSIS

Symbol	Part No.	Description
		TRANSISTOR
Q1	G3407450R	2SD745R
Q2	G3407450R	2SD745R
		DIODE
D1	G2090046	S15VB10
D2	G2090203	SDB205BGD
D3	G2090204	SDB205BRD
D4	G2090205	SDB205BAD
		RESISTOR
R1	J30406029	Cement 10W 0.2Ω
R2	J30406029	" " 0.2Ω
		TERMINAL BOARD
	Q6000030	1L4P 2-0-2
		POTENTIOMETER
VR1	J60800084	VM10A10KΩB
VR2	J60800084	" 10KΩB
		CAPACITOR
C1	K43160002	Electrolytic 35WV 10000μF (35L10000)
C2	K12329002	Ceramic Disc 1.5KV 0.0047μF (ECKDAL472PE)
C3	K12329002	" " " 0.0047μF (ECKDAL472PE)
		SPEAKER
SP1	M4090049	SM-77KY-2
		POWER TRANSFORMER
PT1	L3030093	
		SWITCH
S1	N2090028	8B2011
S2	N2090028	"
		RECEPTACLE
J1	P0090012	FM146S
J2	P1090192	S0-239
		TERMINAL
	Q5000044	T-1 (Red)
	Q5000045	T-1 (Black)
		FUSE HOLDER
F1	P2000012	SN2059

	FUSE
Q0000003	2A (100–117V AC)
Q0000002	1A (200–234V AC)
	TERMINAL POST
Q5000022	STK-A6
	AC POWER CORD
T7600001	2 wire
P0090110	2 prong Rubber plug 1070
T9000482	3 wire, 3 prong UL plug
T9000680	3 wire, 3 prong Australian plug
T9000684	3 wire, 2 prong EU plug
S3000009	Nylon cramp NP-4N

RECEIVER UNIT

Symbol No.	Part No.	Description
PB-2306	F0002306	Printed Circuit Board
	C0023060	P.C.B. with components
PB-2309	F0002309	Printed Circuit Board (Connector board)
		IC, FET, TRANSISTOR
Q1001	G4800600	3SK60 (FET)
Q1002	G4800600	3SK60 (FET)
Q1003	G3305350B	2SC535B (TR)
Q1004	G3319060	2SC1906 (TR)
Q1005	G3319060	2SC1906 (TR)
Q1006	G3305350B	2SC535B (TR)
Q1007	G3305350B	2SC535B (TR)
Q1008	G3305350B	2SC535B (TR)
Q1009	G3304600B	2SC460B (TR)
Q1010	G3304600B	2SC460B (TR)
Q1011	G1090072	μPC577H (IC)
Q1012	G1090218	AN315 (IC)
Q1013	G3304600B	2SC460B (TR)
Q1014	G3304600B	2SC460B (TR)
Q1015	G3304600B	2SC460B (TR)
Q1016	G3304600B	2SC460B (TR)
Q1017	G3304600B	2SC460B (TR)
Q1018	G1090222	MB3756 (IC)
		DIODE
D1001	G2015550	Si 1S1555
D1002	G2015550	" 1S1555
D1003	G2015550	" 1S1555
D1004	G2015550	" 1S1555
D1005	G2015550	" 1S1555
D1006	G2015550	" 1S1555
		CRYSTAL
X1001	H0102029	HC-25/U (fR-21.4)/3MHz
X1002	H0102050	HC-18/U 20.945MHz
		CRYSTAL FILTER
XF1001	H1101990	21J2B2(1/2) PAIR
XF1002	H1101990	21J2B2(1/2)
		CERAMIC FILTER
CF1001	H3900030	LF-B15
CF1002	H3900030	LF-B15
		CERAMIC DISCRIMINATOR
CD1001	H7900010	455D
		POSISTOR
PTH1001	G9090019	PTH-2928
		RESISTOR
R1001	J02245683	Carbon film 1/4W SJ 68kΩ
R1002	J02245273	" " " " 27kΩ
R1003	J02245124	" " " " 120kΩ
R1004	J02245271	Carbon film 1/4W SJ 270Ω
R1005	J02245273	" " " " 27kΩ
R1006	J02245224	" " " " 220kΩ
R1007	J02245473	" " " " 47kΩ
R1008	J02245470	" " " " 47Ω
R1009	J02245471	" " " " 470Ω
R1010	J02245101	" " " " 100Ω
R1011	J02245561	" " " " 560Ω
R1012	J02245103	" " " " 10kΩ
R1013	J02245472	" " " " 4.7kΩ
R1014	J02245471	" " " " 470Ω
R1015	J02245222	" " " " 2.2kΩ
R1016	J02245223	" " " " 22kΩ
R1017	J02245471	" " " " 470Ω
R1018	J02245222	" " " " 2.2kΩ
R1019	J02245223	" " " " 22kΩ
R1020	J02245101	" " " " 100Ω
R1021	J10246102	Carbon composition 1/4W GK 1kΩ
R1022	J02245472	Carbon film 1/4W SJ 4.7kΩ
R1023	J02245223	" " " " 22kΩ
R1024	J02245102	" " " " 1kΩ
R1025	J02245102	" " " " 1kΩ
R1026	J02245223	" " " " 22kΩ
R1027	J02245333	" " " " 33kΩ
R1028	J02245102	" " " " 1kΩ
R1029	J02245101	" " " " 100Ω
R1030	J02245472	" " " " 4.7kΩ
R1031	J02245223	" " " " 22kΩ
R1032	J02245102	" " " " 1kΩ
R1033	J02245102	" " " " 1kΩ
R1034	J02245101	" " " " 100Ω
R1035	J02245222	" " " " 2.2kΩ
R1036	J02245102	" " " " 1kΩ
R1037	J02245154	" " " " 150kΩ
R1038	J02245222	" " " " 2.2kΩ
R1039	J02245154	" " " " 150kΩ
R1040	J02245222	" " " " 2.2kΩ
R1041	J02245222	" " " " 2.2kΩ
R1042	J02245473	" " " " 47kΩ
R1043	J02245102	" " " " 1kΩ
R1044	J02245103	" " " " 10kΩ
R1045	J02245103	" " " " 10kΩ
R1046	J02245332	" " " " 3.3kΩ
R1048	J02245333	" " " " 33kΩ
R1049	J02245820	" " " " 82Ω
R1050	J02245103	" " " " 10kΩ
R1051	J02245473	" " " " 47kΩ
R1052	J02245562	" " " " 5.6kΩ
R1053	J02245332	" " " " 3.3kΩ
R1054	J02245102	" " " " 1kΩ
R1055	J02245333	" " " " 33kΩ
R1056	J02245104	" " " " 100kΩ
R1057	J02245682	" " " " 6.8kΩ
R1058	J02245224	" " " " 220kΩ
R1059	J02245472	" " " " 4.7kΩ
R1060	J02245820	" " " " 82Ω
R1062	J02245332	" " " " 3.3kΩ
R1063	J02245332	" " " " 3.3kΩ
R1064	J02245472	" " " " 4.7kΩ
R1065	J02245391	" " " " 390Ω
R1066	J02245473	" " " " 47kΩ

		POTENTIOMETER
VR1001	J51723103	SR19R 10KΩB
		CAPACITOR
C1003	K08179001	Ceramic Disc 50WV AH 0.5pF (2222-636-03507)
C1006	K10179014	" " " 0.001μF (CK45B1H102MY)
C1007	K10179014	" " " 0.001μF (")
C1008	K10179014	" " " 0.001μF (")
C1009	K10179014	" " " 0.001μF (")
C1012	K08179003	" " " AH 0.35pF (RAU-04-AK-0R 35C)
C1013	K05179005	" " " RH 8pF (2222-636-39808)
C1014	K08179003	" " " AH 0.35pF (RAU-04-AK-0R 35C)
C1017	K10179015	" " " 0.01μF (CK45B1H103MY)
C1018	K05179002	" " " RH 5pF (2222-636-39508)
C1019	K05179013	" " " " 33pF (2222-637-40339)
C1020	K08179003	" " " AH 0.35pF (RAU-04-AK-0R 35C)
C1021	K05179023	" " " RH 15pF (2222-638-40159)
C1022	K05179015	" " " " 47pF (2222-637-40479)
C1023	K10179014	" " " 0.001μF (CK45B1H102MY)
C1024	K10179014	" " " 0.001μF (")
C1025	K10179014	" " " 0.001μF (")
C1026	K10179015	" " " 0.01μF (CK45B1H103MY)
C1027	K10179015	" " " 0.01μF (")
C1028	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)
C1029	K06179048	" " " UJ 15pF (2222-638-58159)
C1030	K10179014	" " " 0.001μF (CK45B1H102MY)
C1031	K06179040	" " " UJ 82pF (2222-637-58829)
C1032	K06179023	" " " " 56pF (2222-637-58569)
C1033	K10179015	" " " 0.01μF (CK45B1H103MY)
C1034	K10179015	" " " 0.01μF (")
C1035	K10179014	" " " 0.001μF (CK45B1H102MY)
C1037	K10179014	" " " 0.001μF (")
C1038	K10179014	" " " 0.001μF (")
C1039	K10179015	" " " 0.01μF (CK45B1H103MY)
C1040	K05179005	Ceramic Disc 50WV RH 8pF (2222-636-39808)
C1041	K10179015	" " " 0.01μF (CK45B1H103MY)
C1042	K10179014	" " " 0.001μF (CK45B1H102MY)
C1043	K08179002	" " " AH 1pF (2222-636-03108)
C1044	K05179008	" " " RH 12pF (2222-636-40129)
C1045	K05179013	" " " " 33pF (2222-637-40339)
C1046	K10179014	" " " 0.001μF (CK45B1H102MY)
C1048	K10179014	" " " 0.001μF (")
C1049	K02179038	" " " CH 7pF (2222-636-09708)
C1050	K10179015	" " " 0.01μF (CK45B1H103MY)
C1051	K10179015	" " " 0.01μF (")
C1052	K10179014	" " " 0.001μF (CK45B1H102MY)
C1053	K06179021	" " " UJ 33pF (2222-636-58339)
C1054	K06179022	" " " " 220pF (2222-637-58221)
C1055	K06179041	" " " " 100pF (2222-637-58101)
C1056	K02179028	" " " CH 10pF (2222-636-10109)
C1057	K10179015	" " " 0.01μF (CK45B1H103MY)
C1058	K70127106	Tantalum 16WV 10μF (CS15E1C100M)
C1059	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)
C1060	K70127475	Tantalum 16WV 4.7μF (CS15E1C4R7M)
C1061	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)
C1062	K10179014	" " " 0.001μF (")
C1063	K70127475	Tantalum 16WV 4.7μF (CS15E1C4R7M)
C1064	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)
C1065	K10179015	" " " 0.01μF (")
C1066	K70127106	Tantalum 16WV 10μF (CS15E1C100M)
C1067	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)
C1068	K10179014	" " " 0.001μF (CK45B1H102MY)
C1069	K10179014	" " " 0.001μF (")
C1070	K10179014	" " " 0.001μF (")
C1071	K50177222	Mylar " 0.0022μF (50F2U222M)
C1072	K70127106	Tantalum 16WV 10μF (CS15E1C100M)

C1073	K50176473	Mylar 50WV 0.047μF (MRS-473K)	C1109	K40129007	Electrolytic 16WV 100μF (16RE100)
C1074	K50176473	" " 0.047μF (")	C1110	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)
C1075	K70127475	Tantalum 16WV 4.7μF (CS15E1C4R7M)	C1111	K40129007	Electrolytic 16WV 100μF (16RE100)
C1076	K50176473	Mylar 50WV 0.047μF (MRS-473K)	C1112	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)
C1077	K50176473	" " 0.047μF (")	C1113	K10179015	" " " 0.01μF (")
C1078	K50176473	" " 0.047μF (")	C1114	K10179014	" " " 0.001μF (CK45B1H102MY)
C1079	K10179015	Ceramic " 0.01μF (CK45B1H103MY)	C1115	K21170002	Feed through " 0.001μF (ECKY1H-102WE)
C1080	K50176473	Mylar " 0.047μF (MRS-473K)	C1116	K21170002	" " " 0.001μF (")
C1081	K10179011	Ceramic Disc " 470pF (2222-660-02471)	C1117	K21170002	" " " 0.001μF (")
C1082	K50177103	Mylar " 0.01μF (50F2U103M)	C1118	K21170002	" " " 0.001μF (")
C1083	K50177222	" " 0.0022μF (50F2U222M)	C1119	K21170002	" " " 0.001μF (")
C1084	K50177222	" " 0.0022μF (")	C1120	K21170002	" " " 0.001μF (")
C1086	K70147105	Tantalum 25WV 1μF (CS15E1E010M)	C1121	K21170002	" " " 0.001μF (")
C1087	K50177332	Mylar 50WV 0.0033μF (50F2U332M)	C1122	K21170002	" " " 0.001μF (")
C1088	K70127226	Tantalum 16WV 22μF (CS15E1C220M)	C1123	K21170002	" " " 0.001μF (")
C1089	K50177102	Mylar 50WV 0.001μF (50F2U102M)	C1124	K21170002	" " " 0.001μF (")
C1090	K10179012	Ceramic Disc " 330pF (2222-660-02331)	C1125	K21170002	" " " 0.001μF (")
C1091	K70127475	Tantalum 16WV 4.7μF (CS15E1C4R7M)	C1126	K21170002	" " " 0.001μF (")
C1092	K70127106	" " 10μF (CS15E1C100K1S)	C1127	K50177103	Mylar " 0.01μF (50F2U103M)
C1093	K40129006	Electrolytic " 470μF (16RE470)			
C1094	K70167154	Tantalum 35WV 0.15μF (CS15E1VR15M)			**TRIMMER CAPACITOR**
			TC1001	K91000029	ECV-1ZW 20x53 20pF
C1095	K50177472	Mylar 50WV 0.0047μF (50F2U472M)	TC1002	K91000029	" " 20pF
C1096	K70127475	Tantalum 16WV 4.7μF (CS15E1C4R7M)			**TRANSFORMER**
C1097	K02179049	Ceramic Disc 50WV CH 100pF (2222-637-10101)	T1001	L0020346	113CN-3393Y
			T1002	L0190013	1Γ3KN-6409X
C1098	K10179013	" " " 820pF (2222-630-02821)	T1003	L0020343	113SN-3392Y
			T1004	L0020343	"
C1099	K70147105	Tantalum 25WV 1μF (CS15E1E010M)	T1005	L0020717	199CC-1125BWN
			T1006	L0020647	199CC-11114N
C1100	K70127106	" 16WV 10μF (CS15E1C100M)	T1007	L0020649	7MC-5896T
C1101	K02179052	Ceramic Disc 50WV CH 5pF (222-636-09508)			**INDUCTOR**
C1102	K10179014	" " " 0.001μF (CK45B1H102MY)	L1001	L0020706	
			L1002	L0020706	
C1106	K40129006	Electrolytic 16WV 470μF (16RE470)	L1004	L1020081A	
			L1005	L0020706	
C1107	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)	L1006	L0020706	
			L1007	L0020706	
C1108	K70147105	Tantalum 25WV 1μF (CS15E1E010M)	L1008	L0020706	
			L1009	L0020706	
			L1010	L1020082A	

L1011	L1020082A				**DIODE**
L1012	L1190017	FL5H-102K 1mH	D2001	G2090084	Varactor MV201
L1013	L1020082A		D2002	G2015550	Si 1S1555
L1014	L1020081		D2003	G2015550	" "
L1015	L1190017	FL5H-102K 1mH			
L1016	L1190017	FL5H-102K 1mH			
L1017	L1190038	FL5H-271K 270μH			**CRYSTAL**
L1018	L2030060		X2001	H0102030	HC-25/U fT/6MHz
L1019	L1020080A				
					POSISTOR
		CRYSTAL SOCKET	PTH2001	G9090019	PTH-2928
XS1001	P3090002	S2-101P-00			
					RESISTOR
		CONNECTOR	R2001	J02245561	Carbon film 1/4W SJ 560Ω
J1001	P0090059	3022-11A	R2002	J02245472	" " " " 4.7kΩ
J1002	P0090091	5049-07A	R2003	J02245103	" " " " 10kΩ
J1003	P0090091	5049-07A	R2004	J02245471	" " " " 470Ω
			R2005	J02245101	" " " " 100Ω
			R2006	J02245102	" " " " 1kΩ
		TP TERMINAL	R2007	J02245103	" " " " 10kΩ
TP1001	Q5000037	TP-H	R2008	J02245473	" " " " 47kΩ
TP1002	Q5000037	"	R2009	J02245101	" " " " 100Ω
			R2010	J02245101	" " " " 100Ω
			R2011	J02245220	" " " " 22Ω
		SHIELD CASE	R2012	J02245220	" " " " 22Ω
	L9190015		R2013	J10246121	" composition 1/4W GK 120Ω
			R2014	J02245333	" film " SJ 33kΩ
		FERRITE BEADS	R2015	J02245333	" " " " 33kΩ
	L9190001	Ri 3x3x1	R2016	J02245473	" " " " 47kΩ
			R2017	J02245333	" " " " 33kΩ
			R2018	J02245104	" " " " 100kΩ
			R2019	J02245470	" " " " 47Ω
			R2020	J02245102	" " " " 1kΩ
			R2021	J02245471	" " " " 470Ω
			R2022	J02245102	" " " " 1kΩ
			R2023	J02245682	" " " " 6.8kΩ
			R2024	J02245683	" " " " 68kΩ
			R2025	J02245331	" " " " 330Ω
			R2026	J02245222	" " " " 2.2kΩ
			R2027	J02245222	" " " " 2.2kΩ
			R2028	J02245333	" " " " 33kΩ
			R2029	J02245100	" " " " 10Ω
		IC, TRANSISTOR	R2030	J02245222	" " " " 2.2kΩ
Q2001	G3305350B	2SC535B (TR)	R2031	J02245103	" " " " 10kΩ
Q2002	G3305350B	" (TR)	R2032	J00245104	" " " " 100kΩ
Q2003	G3305350B	" (TR)	R2033	J02245100	" " " " 10Ω
Q2004	G3319060	2SC1906 (TR)	R2034	J02245101	" " " " 100Ω
Q2005	G3319060	" (TR)	R2039	J02245101	" " " " 100Ω
Q2006	G3319060	" (TR)	R2040	J02245103	" " " " 10kΩ
Q2008	G3320530	2SC2053 (TR)	R2041	J02245229	" " " " 2.2Ω
Q2009	G1090362	M57719 (IC)	R2042	J02245100	" " " " 10Ω
Q2010	G3304600B	2SC460B (TR)	R2045	J02245471	" " " " 470Ω
Q2011	G3304600B	" (TR)	R2046	J02245224	" " " " 220kΩ
Q2012	G1090220	MLM2902 (IC)	R2047	J02245824	" " " " 820kΩ
Q2013	G3208560B	2SB856B (TR)	R2048	J02245333	" " " " 33kΩ
Q2014	G3304580B	2SC458B (TR)	R2049	J02245824	" " " " 820kΩ
Q2015	G1090221	MC3401P (IC)	R2050	J02245334	" " " " 330kΩ
Q2016	G3304600B	2SC460B (TR)	R2051	J02245562	" " " " 5.6kΩ
Q2017	G1090222	MB3576 (IC)	R2052	J02245273	" " " " 27kΩ
			R2053	J02245562	" " " " 5.6kΩ
			R2054	J02245153	" " " " 15kΩ
			R2055	J02245224	" " " " 220kΩ

TRANSMITTER UNIT

Symbol No.	Part No.	Description
PB-2306	F0002306	Printed Circuit Board
	C0023060	P.C.B. with components
PB-2309	F0002309	Printed Circuit Board (Connector board)

R2056	J02245474	Carbon film 1/4W SJ 470kΩ	C2016	K10179015	Ceramic Disc 50WV 0.01μF
R2057	J02245124	" " " " 120kΩ			(CK45B1H103MY)
R2058	J02245155	" " " " 1.5MΩ	C2017	K02179032	" " " CH 120pF
R2059	J02245223	" " " " 22kΩ			(2222-637-10121)
R2060	J02245104	" " " " 100kΩ	C2019	K10179015	" " " 0.01μF
R2061	J02245473	" " " " 47kΩ			(CK45B1H103MY)
R2062	J02245103	" " " " 10kΩ	C2020	K10179015	" " " 0.01μF
R2063	J02245103	" " " " 10kΩ			(")
R2064	J02245153	" " " " 15kΩ	C2023	K10179015	" " " 0.01μF
R2065	J02245104	" " " " 100kΩ			(")
R2066	J02245102	" " " " 1kΩ	C2026	K05179014	" " " RH 39pF
R2067	J02245103	" " " " 10kΩ			(2222-637-40399)
R2068	J02245103	" " " " 10kΩ	C2028	K10179015	" " " 0.01μF
R2069	J02245102	" " " " 1kΩ			(CK45B1H103MY)
R2070	J02245102	" " " " 1kΩ	C2029	K10179015	" " " 0.01μF
R2071	J02245103	" " " " 10kΩ			(")
R2072	J02245153	" " " " 15kΩ	C2030	K08179001	" " " AH 0.5pF
R2073	J02245102	" " " " 1kΩ			(2222-636-03507)
R2074	J02245103	" " " " 10kΩ	C2033	K10179014	" " " 0.001μF
R2075	J10246103	" composition 1/4W GK 10kΩ			(CK45B1H102MY)
R2076	J02245154	" film " SJ 150kΩ	C2034	K10179014	" " " 0.001μF
R2077	J02245683	" " " " 68kΩ			(")
R2078	J02245103	" " " " 10kΩ	C2035	K10179015	" " " 0.01μF
R2079	J02245472	" " " " 4.7kΩ			(CK45B1H103MY)
R2080	J02245471	" " " " 470Ω	C2036	K10179014	" " " 0.001μF
R2081	J02245332	" " " " 3.3kΩ			(CK45B1H102MY)
R2082	J02245562	" " " " 5.6kΩ	C2038	K02179028	" " " CH 10pF
R2083	J02245391	" " " " 390Ω			(2222-636-10109)
			C2039	K02179036	" " " " 47pF
					(2222-637-10479)
		POTENTIOMETER	C2040	K10179014	" " " 0.001μF
VR2001	J51723103	SR19R-10KB 10kΩB			(CK45B1H102MY)
VR2002	J51724103	PN822H103H 10kΩB	C2041	K10179014	" " " 0.001μF
					(")
			C2042	K10179014	" " " 0.001μF
					(")
		CAPACITOR	C2043	K10179014	" " " 0.001μF
C2001	K06179048	Ceramic Disc 50WV UJ 15pF			(")
		(2222-638-58159)	C2044	K02179028	" " " CH 10pF
C2002	K10179014	" " " 0.001μF			(2222-636-10109)
		(CK45B1H102MY)	C2045	K02175150	" " " " 15pF
C2003	K06179042	" " " UJ 120pF			(DD104CH150J50V02)
		(2222-637-58121)	C2046	K02175150	" " " " 15pF
C2004	K06179041	" " " " 100pF			(")
		(2222-637-58101)	C2047	K02175150	" " " " 15pF
C2005	K10179015	" " " 0.01μF			(")
		(CK45B1H103MY)	C2048	K02175150	" " " " 15pF
C2006	K10179015	" " " 0.01μF			(")
		(")	C2049	K02175150	" " " " 15pF
C2007	K02179049	" " " CH 100pF			(")
		(2222-637-10101)	C2050	K02175150	" " " " 15pF
C2008	K10179015	" " " 0.01μF			(")
		(CK45B1H103MY)	C2051	K50177223	Mylar " 0.022μF
C2009	K05179013	" " " RH 33pF			(50F2U223M)
		(2222-637-40339)	C2052	K50177102	" " 0.001μF
C2010	K10179015	" " " 0.01μF			(50F2U102M)
		(CK45B1H103MY)	C2053	K70147105	Tantalum 25WV 1μF
C2012	K10179014	" " " 0.001μF			(CS15E1E010M)
		(CK45B1H102MY)	C2054	K70127475	" 16WV 4.7μF
C2013	K02179032	" " " CH 120pF			(CS15E1C4R7M)
		(2222-637-10121)	C2055	K70147105	" 25WV 1μF
C2014	K10179014	" " " 0.001μF			(CS15E1E010M)
		(CK45B1H102MY)	C2056	K50177332	Mylar 50WV 0.0033μF
C2015	K70127475	Tantalum 16WV 4.7μF			(50F2U332M)
		(CS15E1C4R7M)			

C2057	K50177102	Mylar 50WV 0.001μF (50F2U102M)	C2093	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)
C2058	K02179050	Ceramic Disc " CH 39pF (2222-637-10399)	C2094	K10179015	" " " 0.001μF (CK45B1H103MY)
C2059	K70147105	Tantalum 25WV 1μF (CS15E1E010M)	C2095	K40129007	Electrolytic 16WV 100μF (16RE100)
C2060	K50177223	Mylar 50WV 0.022μF (50F2U223M)	C2096	K70147105	Tantalum 25WV 1μF (CS15E1V010M)
C2061	K70127106	Tantalum 16WV 10μF (CS15E1C100M)	C2097	K40129006	Electrolytic 16WV 470μF (16RE470)
C2062	K40129007	Electrolytic " 100μF (16RE100)	C2098	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)
C2063	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)	C2099	K02175150	" " " CH 15pF (DD104CH150J50V02)
C2064	K70147105	Tantalum 25WV 1μF (CS15E1E010M)	C2100	K02175150	" " " " 15pF (")
C2065	K70167474	" 35WV 0.47μF (CS15E1VR47)	C2101	K21170002	Feed through " 0.001μF (ECKY1H-102WE)
C2066	K70127106	" 16WV 10μF (CS15E1C100M)	C2102	K21170002	" " " 0.001μF (")
C2067	K10179014	" 50WV 0.001μF (CK45B1H102MY)	C2103	K21170002	" " " 0.001μF (")
C2068	K07179021	Ceramic Disc " PH 150pF (2222-637-34151)	C2104	K21170002	" " " 0.001μF (")
C2069	K10179015	" " " 0.01μF (CK45B1H103MY)	C2105	K21170002	" " " 0.001μF (")
C2070	K10179014	" " " 0.001μF (CK45B1H102MY)	C2106	K21170002	" " " 0.001μF (")
C2071	K10179014	" " " 0.001μF (CK45B1H102MY)			
C2072	K10179014	" " " 0.001μF (")			**TRIMMER CAPACITOR**
			TC2001	K91000029	ECV-1ZW-20x53 20pF
C2073	K10179015	" " " 0.01μF (CK45B1H103MY)	TC2002	K91000028	" -10x53 10pF
			TC2003	K91000028	" -10x53 10pF
C2074	K10179014	" " " 0.001μF (CK45B1H102MY)	TC2006	K91000028	" -10x53 10pF
C2075	K02179032	" " " CH 120pF (2222-637-10121)			**TRANSFORMER**
C2076	K10179014	" " " " 0.001μF (CK45B1H102MY)	T2001	L0020666	113CN-6391Z
			T2002	L0190011	113CN-6394N
C2077	K10179014	" " " 0.001μF (")	T2003	L0190011	113CN-6394N
			T2004	L0020652	113CN-6396Z
C2080	K70127336	Tantalum 16WV 33μF (CS15E1C330M)	T2005	L0020346	113CN-3393Y
			T2006	L0020653	113SN-6397Y
C2081	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)	T2007	L0020653	113SN-6397Y
			T2008	L0020429	113SN-4530Y
C2082	K50177103	Mylar " 0.01μF (50F2U103M)	T2009	L0020429	113SN-4530Y
C2083	K70127106	Tantalum 16WV 10μF (CS15E1C100M)			**INDUCTOR**
C2084	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)	L2001	L1190017	FL5H-102K 1mH
			L2002	L1020081A	
C2085	K10179014	" " " 0.001μF (")	L2003	L1020081A	
			L2004	L1020081A	
C2086	K70127336	Tantalum 16WV 33μF (CS15E1C330M)	L2005	L0020679	
			L2006	L1020081A	
C2087	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)	L2007	L0020679	
			L2008	L0020852	
C2088	K10179014	" " " 0.001μF (")	L2013	L0020678	
			L2014	L0020679	
C2091	K08179001	" " " AH 0.5pF (2222-636-03507)	L2015	L1020079A	
			L2016	L0020679	
C2092	K10179015	" " " 0.01μF (CK45B1H103MY)	L2017	L0020679	
			L2018	L0020679	
			L2019	L1020080A	

L2020	L1020080A	
L2021	L1190041	181LY-104K 100mH
L2022	L2030060	
L2023	L1020080A	
L2024	L1190017	FL5H-102K 1mH
L2025	L0020334	
		CRYSTAL SOCKET
XS2001	P3090002	S2-101P-00
		CONNECTOR
J2001	P0090092	3022-08A
J2002	P1090254	BNC-LR
J2003	P0090091	5049-07A
J2004	P1090016	SQ3056
		TP TERMINAL
TP2001	Q5000037	TP-H
TP2002	Q5000037	
TP2003	Q5000037	
TP2004	Q5000037	
TP2006	Q5000037	
TP2007	Q5000037	
		PIN PLUG
P2004	P0090009	SQ4152

C.O.S UNIT

Symbol No.	Part No.	Description
PB-2307	F0002307	Printed Circuit Board
	C0023070	P.C.B. with components
		IC, TRANSISTOR
Q3001	G1090220	MLM2902 (IC)
Q3002	G1090374	MC1458CP (IC)
Q3003	G1090124	MC14016B (IC)
Q3004	G1090052	MC14049B (IC)
Q3005	G1090052	" (IC)
Q3006	G3304580B	2SC458B (TR)
Q3007	G3304580B	" (TR)
Q3008	G1090375	MC14536B (IC)
Q3009	G3304580B	2SC458B (TR)
		DIODE
D3001	G2015550	Si 1S1555
D3002	G2015550	" "
D3003	G2015550	" "
D3004	G2015550	" "
D3005	G2015550	" "
D3006	G2015550	" "
D3007	G2015550	" "
D3008	G2015550	" "

		RESISTOR
R3001	J10246103	Carbon composition 1/4W GK 10kΩ
R3002	J02245473	" film " SJ 47kΩ
R3003	J10246393	" composition 1/4W GK 39kΩ
R3004	J10246393	" " " " 39kΩ
R3005	J02245183	" film " SJ 18kΩ
R3006	J02245393	" " " " 39kΩ
R3007	J10246273	" composition 1/4W GK 27kΩ
R3008	J02245104	" film " SJ 100kΩ
R3009	J10246473	" composition 1/4W GK 47kΩ
R3010	J10246473	" " " " 47kΩ
R3011	J02245473	" film " SJ 47kΩ
R3012	J10246473	" Composition GK 47kΩ
R3013	J02245153	" film " SJ 15kΩ
R3014	J10246153	" composition 1/4W GK 15kΩ
R3015	J02245473	" film " SJ 47kΩ
R3016	J02245473	" " " " 47kΩ
R3017	J02245473	" " " " 47kΩ
R3018	J02245473	" " " " 47kΩ
R3019	J02245103	" " " " 10kΩ
R3020	J02245103	" " " " 10kΩ
R3021	J02245103	" " " " 10kΩ
R3022	J02245103	" " " " 10kΩ
R3023	J02245473	" " " " 47kΩ
R3024	J02245103	" " " " 10kΩ
R3025	J02245103	" " " " 10kΩ
R3026	J10246103	" composition 1/4W GK 10kΩ
R3027	J10246103	" " " " 10kΩ
R3028	J02245473	" film " SJ 47kΩ
R3029	J02245332	" " " " 3.3kΩ
R3030	J02245473	" " " " 47kΩ
R3031	J02245473	" " " " 47kΩ
R3032	J02245473	" " " " 47kΩ
R3033	J10246473	" composition 1/4W GK 47kΩ
R3034	J02245473	" film " SJ 47kΩ
R3035	J02245103	" " " " 10kΩ
R3036	J02245473	" " " " 47kΩ
R3037	J10246473	" composition 1/4W GK 47kΩ
R3038	J02245330	" film " SJ 33Ω
R3039	J02245473	" " " " 47kΩ
R3040	J02245103	" " " " 10kΩ
		POTENTIOMETER
VR3001	J51724503	PN822H503 50kΩB
VR3002	J51724103	" 103 10kΩB
VR3003	J51724102	" 102 1kΩB
VR3004	J51739205	EVM-G0GA01B26 2MΩB
VR3005	J51724103	PN822H103 10kΩB
		CAPACITOR
C3001	K70127106	Tantalum 16WV 10μF (CS15E1C100M)
C3002	K50177332	Mylar 50WV 0.0033μF (50F2U332M)

C3003	K10179011	Ceramic Disc 50WV 470pF (2222-660-02471)
C3004	K50177222	Mylar " 0.0022μF (50F2U222M)
C3005	K50177222	" " 0.0022μF (")
C3006	K50177222	" " 0.022μF (")
C3008	K70127106	Tantalum 16WV 10μF (CS15E1C100M)
C3009	K70127106	" " 10μF (")
C3010	K70127476	" " 47μF (CS15E1C470M)
C3011	K70127476	" " 47μF (")
C3012	K10179014	Ceramic Disc 50WV 0.001μF (CK45B1H102MY)
C3013	K70127225	Tantalum 16WV 2.2μF (CS15E1C2R2M)
C3014	K50177103	Mylar 50WV 0.01μF (50F2U103M)
C3015	K50177103	" " 0.01μF (50F2U103M)
C3016	K50177222	" " 0.0022μF (50F2U222M)
C3017	K10179014	Ceramic Disc " 0.001μF (CK45B1H102MY)
C3018	K10179014	" " " 0.001μF (")
C3019	K10179014	" " " 0.001μF (")
C3020	K50177103	Mylar " 0.01μF (50F2U103M)
C3021	K50177103	" " 0.01μF (")
C3022	K10179014	Ceramic Disc " 0.001μF (CK45B1H102MY)
		RELAY
RL3001	M1190008	FBR-221D-006
		CONNECTOR
J3001	P0090054	5048-07A
J3002	P0090054	"
J3003	P0090054	"
J3004	P0090051	5048-06A
		TP TERMINAL
TP3001–3004	Q5000037	TP-H

REGULATOR UNIT

Symbol No.	Part No.	Description
PB-2248	F0002248	Printed Circuit Board
	C0022480	P.C.B. with compoents
		IC, TRANSISTOR
Q4001	G1090373	TA7089P (IC)
Q4002	G34088000	2SD880O (TR)
		DIODE
D4001	G2090001	Si 10D1
D4002	G2090001	" "
		RESISTOR
R4001	J02245151	Carbon film 1/4W SJ 150Ω
R4002	J02245103	" " " " 10kΩ
R4003	J02245331	" " " " 330Ω
R4004	J02245332	" " " " 3.3kΩ
R4005	J02245822	" " " " 8.2kΩ
R4006	J20306102	Metallic " 1W 1kΩ
R4007	J10276681	Carbon composition 1/2W GK 680Ω
		POTENTIOMETER
VR4001	J51721502	EVLS3AA00B53 5kΩB
VR4002	J51721102	" 13 1kΩB
		CAPACITOR
C4001	K40169003	Electrolytic 35WV 330μF (35RE330)
C4002	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)
C4003	K50177333	Mylar " 0.033μF (F2U333)
C4004	K10179015	Ceramic Disc " 0.01μF (CK45B1H103MY)
C4005	K10179014	" " " 0.001μF (CK45B1H102MY)
C4006	K40129011	Electrolytic 16WV 1000μF (16RE1000)
C4007	K10179015	Ceramic Disc 50WV 0.01μF (CK45B1H103MY)
	Q5000011	Wrapping terminal C

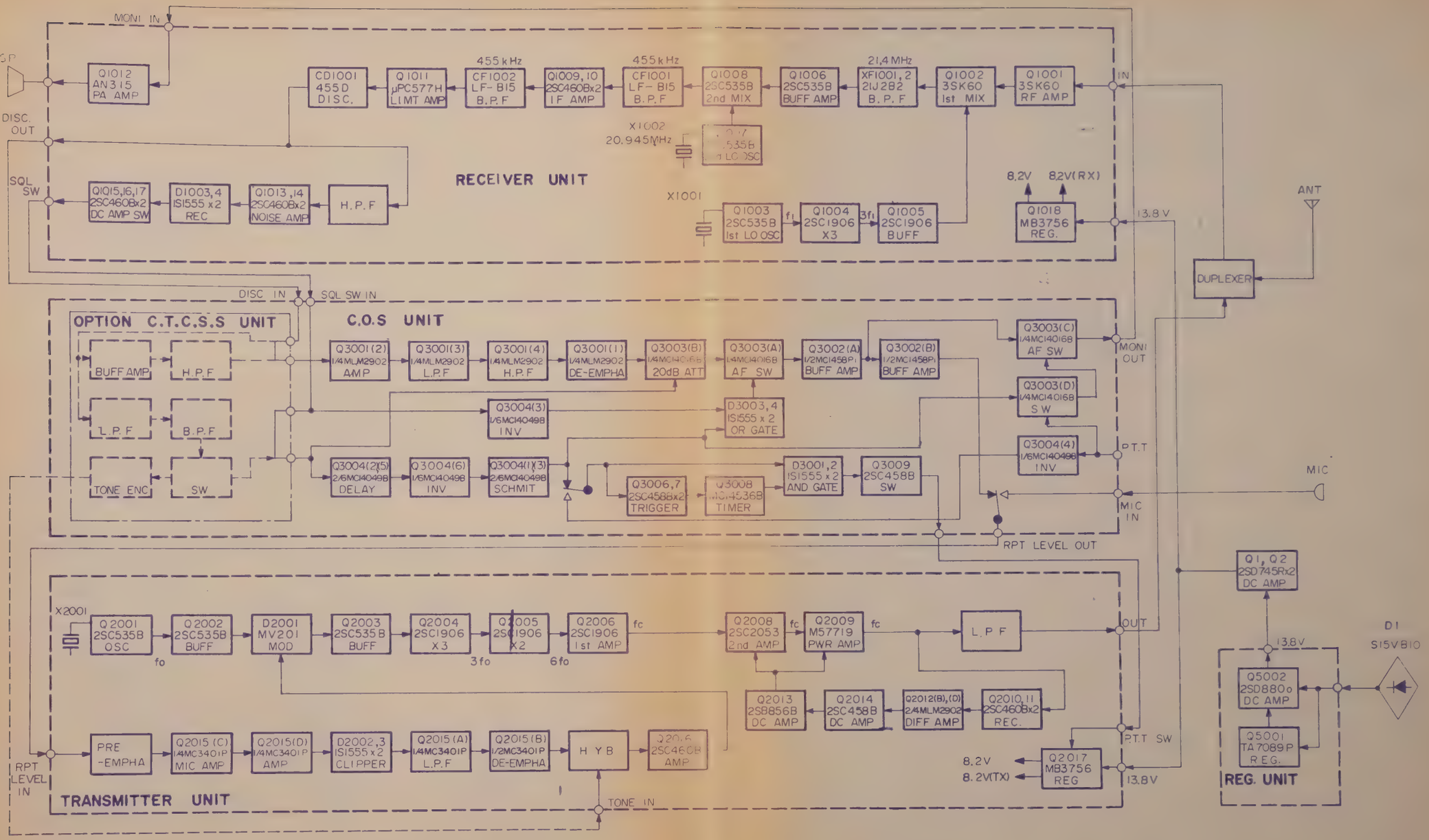
RELAY UNIT

Symbol No.	Part No.	Description
PB-2308	F0002308	Printed Circuit Board
	C0023080	P.C.B. with components
		IC
Q5001	G1090301	7812H
		DIODE
D5001	G2090034	Si U05B
D5002	G2090034	Si "
D5003	G2015550	Si 1S1555

		RESISTOR
R5001	J30376569	Cement 5W 5.6Ω
		CAPACITOR
C5001	K50177103	Mylar 50WV 0.01μF (50F2U103M)
C5002	K70167334	Tantalum 35WV 0.33μF (CS15E1VR33M)
C5003	K70127475	" 16WV 4.7μF (CS15E1C4R7M)
		RELAY
RL5001	M1090019	HC-2-DC-12V
RLS5001	M1390010	HC-2
		DC FUSE
F5001	Q0000006	4A
		DC FUSE HOLDER
	P2000003	F3265
		TP TERMINAL
	Q5000037	TP-H

TUNING CAPACITOR

Symbol No.	Part No.	Description
148MHz–160MHz BAND		
C1001	K05179004	Ceramic disc 50WV RH 7pF (2222-636-39708)
C1002	K05179012	" " " RH 27pF (2222-637-40279)
C1004	K05179024	" " " RH 33pF (2222-632-40339)
C1005	K02179055	" " " CH 3pF (2222-636-09308)
C1010	K05179014	" " " RH 39pF (2222-637-40399)
C1011	K05179004	" " " RH 7pF (2222-636-39708)
C1015	K05179012	" " " RH 27pF (2222-637-40279)
C1016	K08179001	" " " AH 0.5pF (2222-636-03507)
C1103	K08179002	" " " AH 1pF (2222-636-03108)
C2018	K05179015	" " " RH 47pF (2222-637-40479)
C2021	K05179016	" " " RH 56pF (2222-637-40569)
C2022	K05179008	" " " RH 12pF (2222-636-40129)
C2024	K08179004	" " " AH 1pF (2222-638-03108)
C2025	K05179023	" " " RH 15pF (2222-638-40159)
C2027	K05179007	Ceramic disc 50WV RH 10pF (2222-636-40109)
C2031	K05179007	" " " RH 10pF (2222-636-40109)
C2032	K05179015	" " " RH 47pF (2222-637-40479)
C2037	K02179045	" " " CH 2pF (2222-636-10109)
160MHz–174MHz BAND		
C1001	K05179003	Ceramic disc 50WV RH 6pF (2222-632-39608)
C1002	K05179011	" " " RH 22pF (2222-638-40229)
C1004	K05179012	" " " RH 27pF (2222-638-40279)
C1005	K05179026	" " " RH 2pF (2222-632-39208)
C1010	K05179013	" " " RH 33pF (2222-638-40339)
C1011	K05179003	" " " RH 6pF (2222-632-39608)
C1015	K05179011	" " " RH 22pF (2222-638-40229)
C1016	–	Not used
C1103	–	Not used
C2018	K05179014	" " " RH 39pF (2222-638-40399)
C2021	K05179015	" " " RH 47pF (2222-638-40479)
C2022	K05179007	" " " RH 10pF (2222-632-40109)
C2024	K08179001	" " " AH 0.5pF (2222-632-03507)
C2025	K05179008	" " " RH 12pF (2222-632-40129)
C2027	K05179005	" " " RH 8pF (2222-632-39808)
C2031	K05179005	" " " RH 8pF (2222-632-39808)
C2032	K05179014	" " " RH 39pF (2222-638-40399)
C2037	K02182159	" " 63WV CH 1.5pF (DR870CH1R563V)



NOTE : $f_o = f_c/6$

$f_1 = (f_c - 21.4\text{MHz})/3$

FTR-2410
BLOCK DIAGRAM

RECEIVER UNIT (PB-2306)

(NO.1···)

Q01 3SK60

Q02 3SK60

Q06 2SC535B

Q08 2SC535B

Q09 Q10 2SC460B×2

Q11 uPC577H

Q03 2SC535B

Q04 2SC1906

Q05 2SC1906

Q07 2SC535B

Q13 Q14 2SC460B x 5 Q15 Q16

Q17

Q12 AN315

Q18 MB3756

DUPLEXER UNIT

SQUELCH

SP

VOLUME

BUSY

XMIT

MIC

RPT MIC

S1 OFF POWER

J2 DC

AC

FUSE

C.O.S UNIT (PB-2307)

(NO.3···)

Q01(2)

Q01(3)

Q01(4)

Q01 MLM2902

Q01(1)

Q03(A)

Q03(B)

Q02 (A)

Q03(C)

Q02(B)

Q02 MC 1458CP

Q03 MC14016B

Q03(D)

Q04(3)

Q04(4)

Q06 2SC458B

Q05(6)

Q05(5)

Q05(4)

Q07 2SC458B

Q08 MC14536B

Q05(1)

Q09 2SC458B

Q04(1) Q05(3)

Q04(5) Q04(6)

Q04(2)

Q04:MC14049B Q05:MC14049B

OPTION (C.T.C.S.S)

NOTES

1. ALL RESISTORS IN Ω 1/4W ± 10% UNLESS OTHERWISE NOTED.
2. ALL CAPACITORS IN μF 16WV UNLESS OTHERWISE NOTED.
3. ※ COMPONENT SEE TABLE.

(PB-2308)

Q1, Q2: 2SD745R

RL UNIT

Q02 2SD880-O

Q01 TA7089P

REG. UNIT (PB-2248)

TRANSMITTER UNIT (PB-2306)

(NO.2···)

Q01 2SC535B

Q02 2SC535B

Q03 2SC535B

Q04 2SC1906

Q05 2SC1906

Q06 2SC1906

Q08 2SC2053

Q09 M57719

Q15-C

Q15-D

Q15-A

Q15-B

Q15 MC3401P

Q16 2SC460B

Q11 2SC460B

Q13 2SB856B

Q12(B)

Q12(D)

Q12 MLM2902

Q14 2SC458B

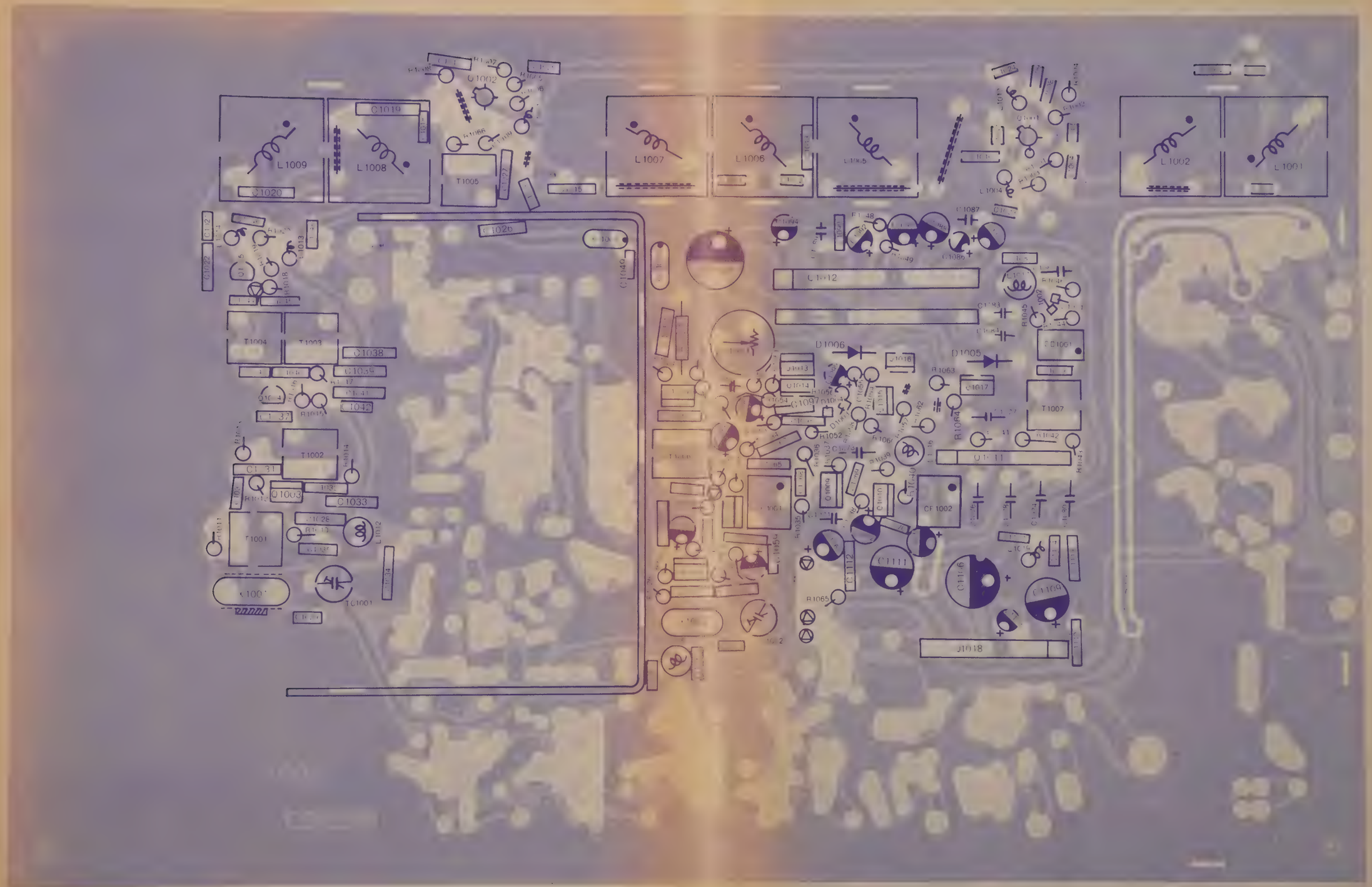
Q10 2SC460B

Q17 MB3756

FTR-2410
CIRCUIT DIAGRAM

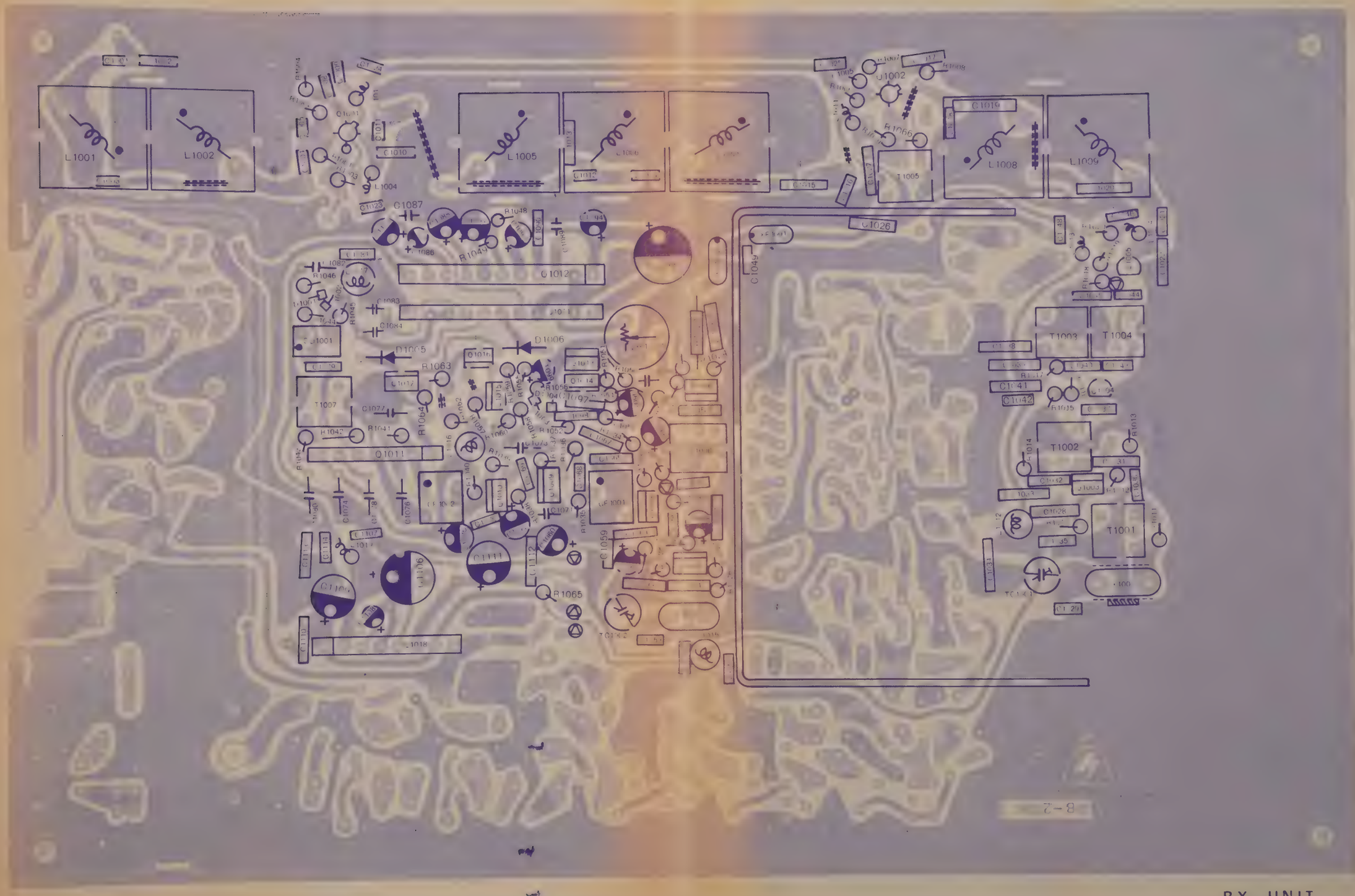
※COMPONENT TABLE

	144~148 MHz	148~160 MHz	160~174 MHz		144~148 MHz	148~160 MHz	160~174 MHz
C1001	7PF	7PF	6PF	C2018	56PF	47PF	39PF
C1002	27PF	27PF	22PF	C2021	68PF	56PF	47PF
C1004	33PF	33PF	27PF	C2022	15PF	12PF	10PF
C1005	3PF	3PF	2PF	C2024	1PF	1PF	0.5PF
C1010	39PF	39PF	33PF	C2025	15PF	15PF	12PF
C1011	7PF	7PF	6PF	C2027	10PF	10PF	8PF
C1015	27PF	27PF	22PF	C2031	10PF	10PF	8PF
C1016	1PF	0.5PF	–	C2032	47PF	47PF	39PF
C1103	3PF	1PF	–	C2037	2PF	2PF	1.5PF
C1128	4PF	–	–				



VIEWED FROM COMPONENT SIDE

RX UNIT
PB-2306


L1001
L1002
L1004
L1005
L1008
L1009
Q1002
T1005
T1003
T1004
T1002
T1001
Q1011
T1007
D1005
D1006
C1087
C1026
C1012
C1041
C1042
R1063
R1065
R1066
C1059
C1111
C1106
C1112
C1107
C1076
C1077
C1074
C1078
C1028
R1013
R1014
R1015
R1046
R1048
R1049
R1042
R1041
R1064
R1052
C1084
C1083
C1086
C1049
C1019
C1010
C1123
C1015
C1018
C1110
C1100
C1102
C1103
C1104
C1105
C1108
C1109
C1113
C1114
C1115
C1116
C1117
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C1119
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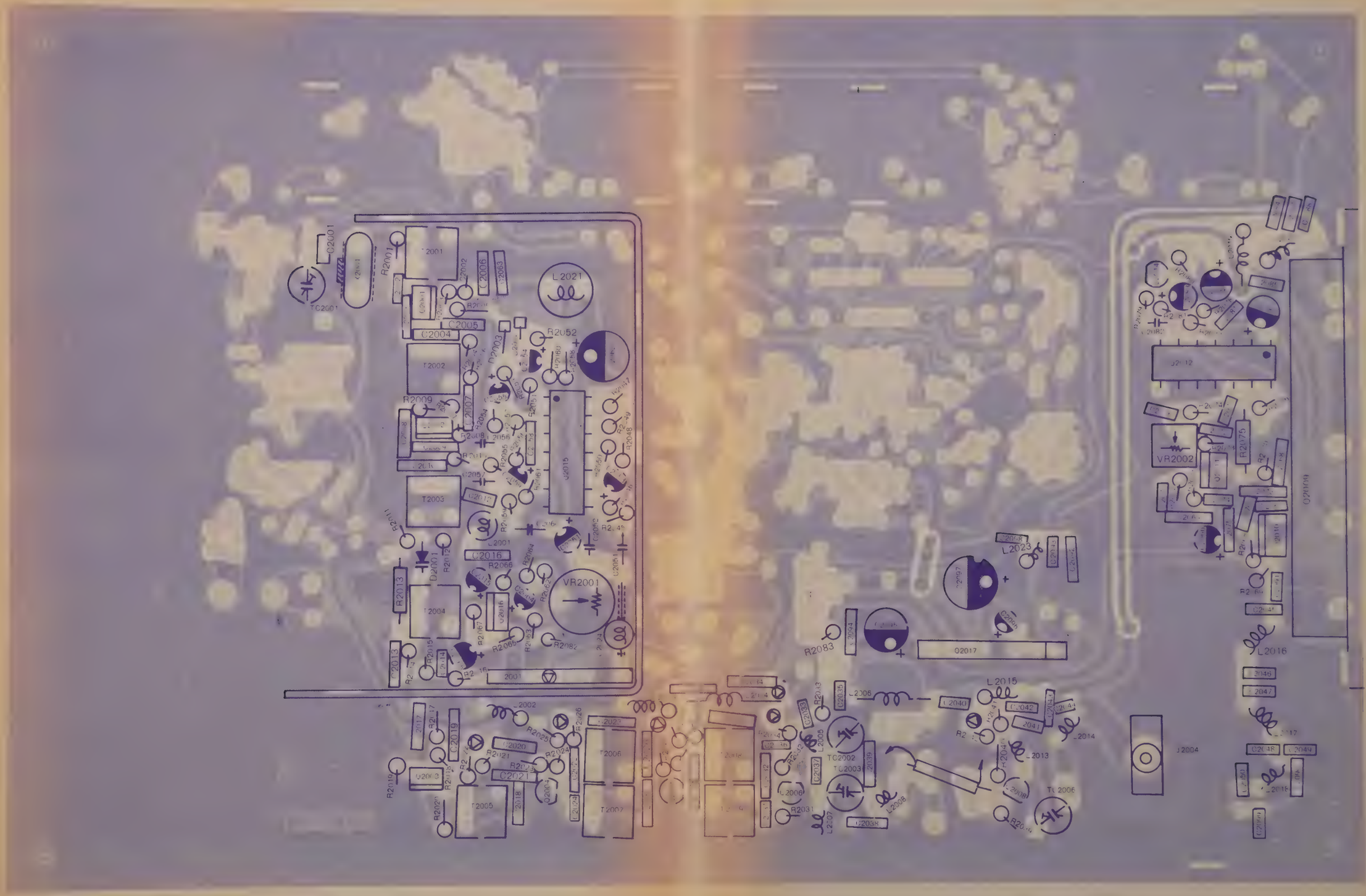
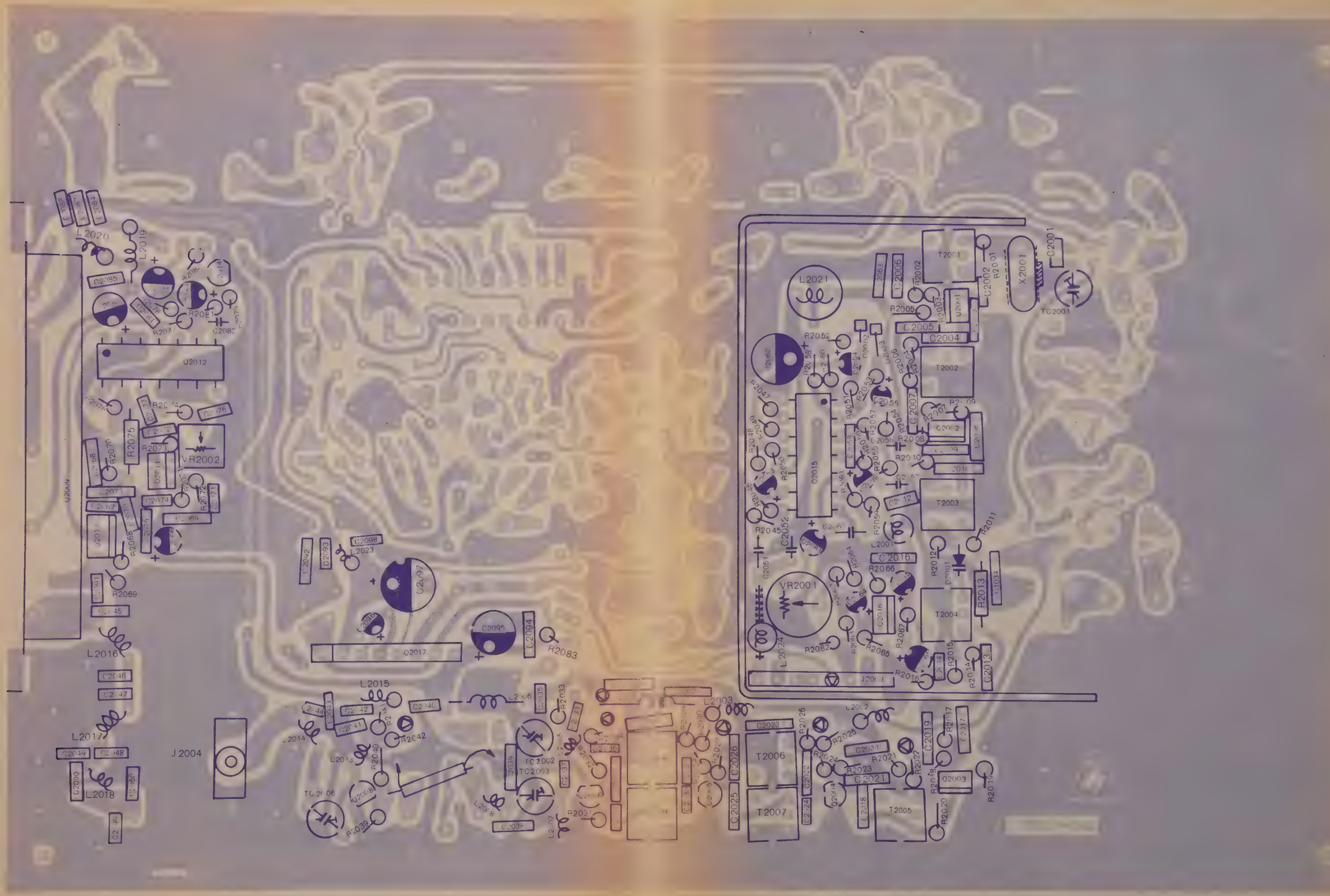
C1163



VIEWED FROM COMPONENT SIDE

TX UNIT

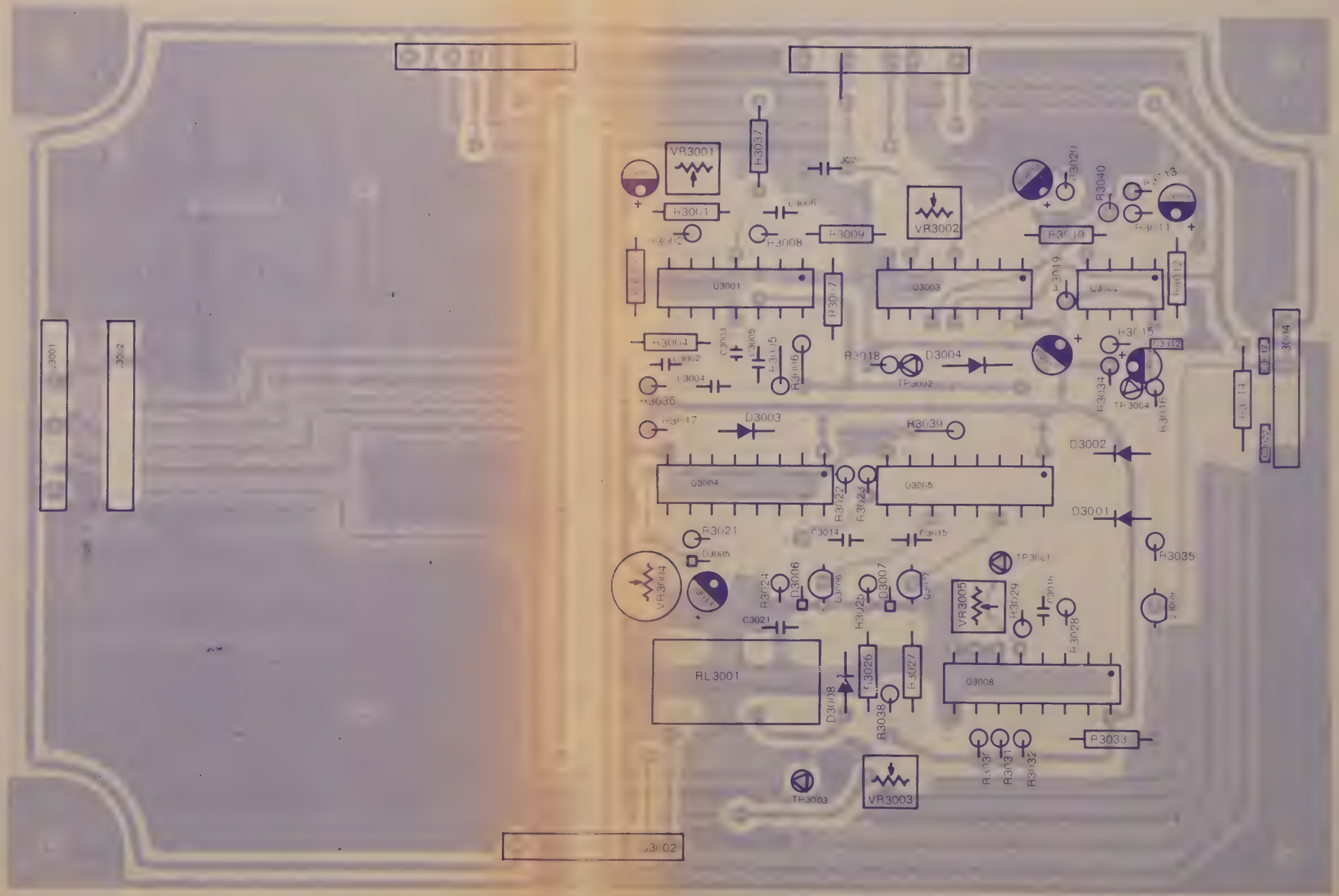
PB-2306



VIEWED FROM SOLDER SIDE

TX UNIT

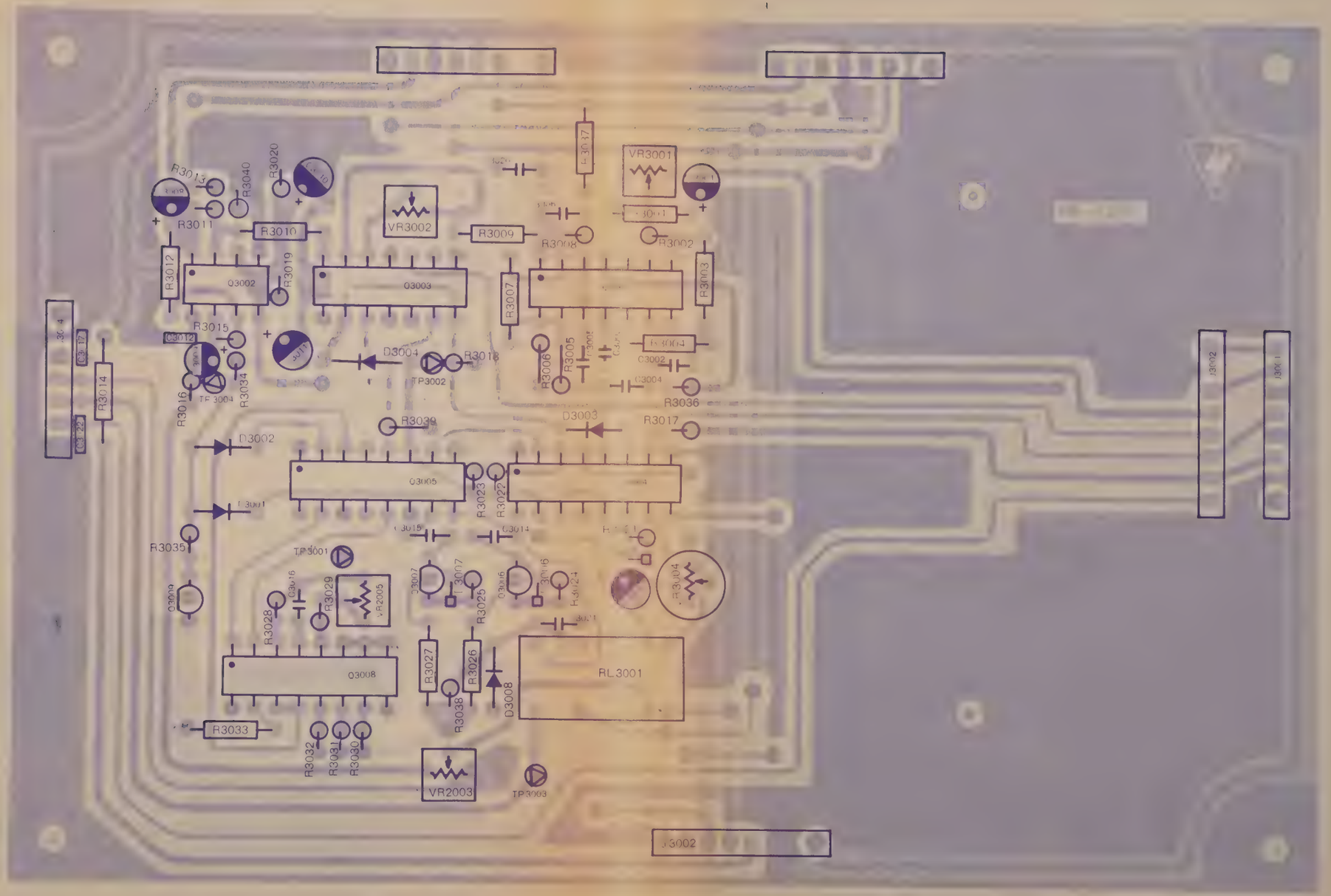
PB-2306



VIEWED FROM COMPONENT SIDE

C.O.S. UNIT

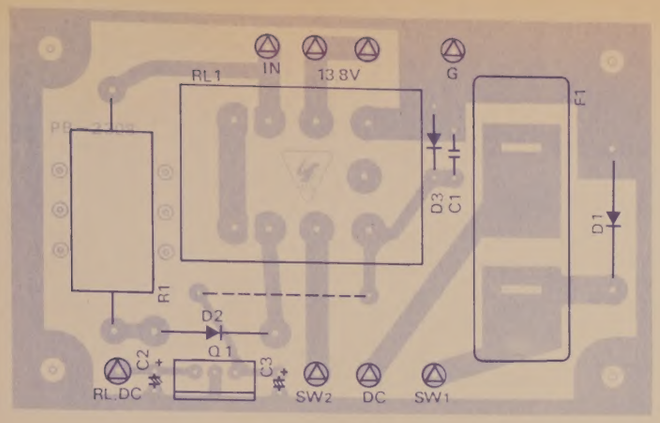
PB-2307



VIEWED FROM SOLDER SIDE

C.O.S. UNIT

PB-2307



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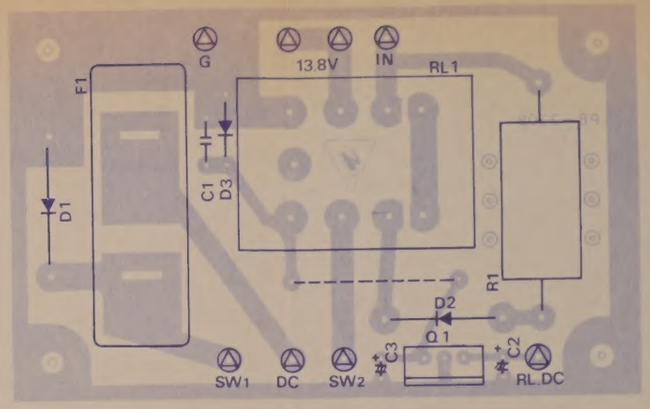
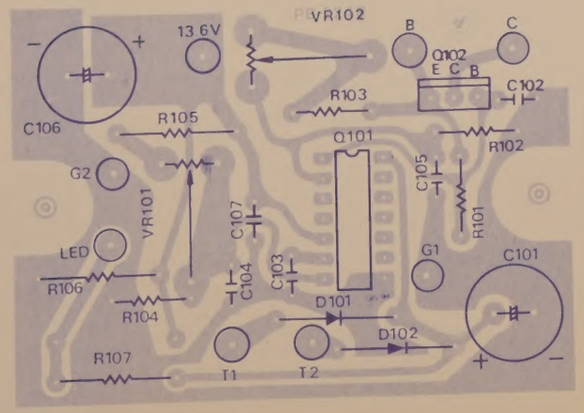


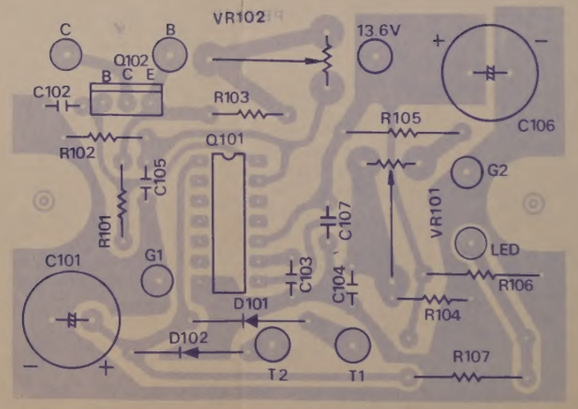
VIEWED FROM COMPONENT SIDE

RL UNIT

PB-2308



VIEWED FROM SOLDER SIDE



VIEWED FROM COMPONENT SIDE

REG. UNIT

PB-2248

YAESU

94088